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(71) **Applicant (for all designated States except US):** **THE GENERAL HOSPITAL CORPORATION** [US/US]; 55 Fruit Street, Boston, MA 02114 (US).

(72) **Inventors; and**

(75) **Inventors/Applicants (for US only):** **TEARNEY, Guillermo, J.** [US/US]; 118 Kinnaird St., #3, Cambridge, MA 02139 (US). **IFTIMIA, Nicusor. BOUMA, Brett, E.** [US/US]; 12 Monmouth St., Quincy, MA 02171 (US).

(74) **Agent:** **ABELEV, Gary;** Dorsey & Whitney L.L.P., 250 Park Avenue, New York, NY 10177 (US).

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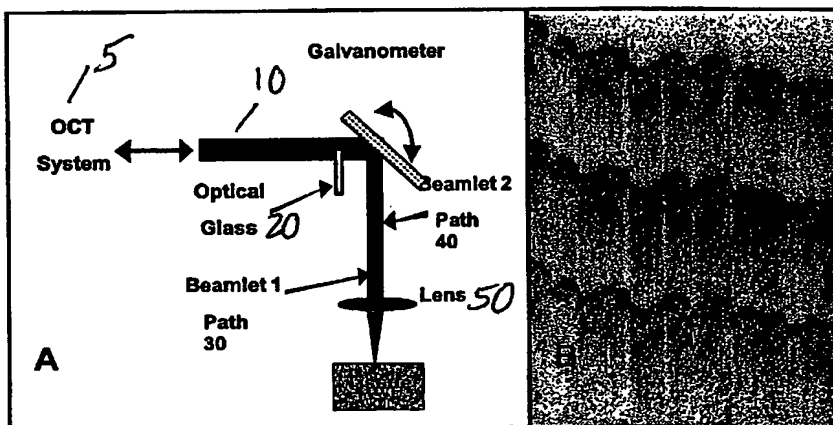
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- (54) Title:** SPECKLE REDUCTION IN OPTICAL COHERENCE TOMOGRAPHY BY PATH LENGTH ENCODED ANGULAR COMPOUNDING



(57) Abstract: Speckle, a factor reducing image quality in optical coherence tomography ("OCT"), can limit the ability to identify cellular structures that are important for the diagnosis of a variety of diseases. The present invention allows for an implementation of an angular compounding, angular compounding by path length encoding ("ACPE") for reducing speckle in OCT images. By averaging images obtained at different incident angles, with each image encoded by path length, ACPE maintains high-speed image acquisition and implements minimal modifications to OCT probe optics. ACPE images obtained from tissue phantoms and human skin in vivo demonstrate a qualitative improvement over traditional OCT and an increased signal-to-noise ratio ("SNR"). Accordingly, apparatus probe catheter, and method are provided for irradiating a sample. In particular, an interferometer (5) may forward forwarding an electromagnetic radiation (10). In addition, a sample arm may receive the electromagnetic radiation, and can include an arrangement (20) which facilitates a production of at least two radiations (30, 40) from the electromagnetic radiation so as to irradiate the sample. Such arrangement can be configured to delay a first radiation of the at least two radiations with respect to a second radiation of the at least two radiations.

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A. CLASSIFICATION OF SUBJECT MATTER

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US CL : 356/479

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 356/479, 497

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- A	WO 01/33820 A1 (HAAG-STREIT AG) 31 May 2001(31.5.2001), see figure 4.	1, 11-13, 21-23, 25, 26 ----- 2-10, 14-20-, 24

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Samuel A. Turner

Telephone No. 703-308-0956